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MEMORANDUM

DATE: March 21, 2011

TO: Renee Nordeen, Project Manager, Ecology and Environment, Inc., Seattle, WA

FROM: Mark Woodke, START QA Chemist, Ecology and Environment, Inc., Seattle, WA

SUBJ: TDD: 10-11-0007 Example SQL calculations for the Emergency Removal Action

Example sample quantitation limit (SQL) calculations for soil samples collected for the Incident Action and Time Critical Removal Action that was performed on behalf of Cascade Natural Gas Corporation by Anchor QEA, LLC in January 2011 at the Bremerton Gasworks site are provided below. Actual SQLs are provided at the end of this memo. These sample quantitation limits meet the definition provided in the U.S. Environmental Protection Agency, December 14, 1990, Hazard Ranking System, Final Rule, 40 CFR Part 300, page 51586. Raw data were not available for these results, so SQLs were obtained from the attached method blank results and associated dilution factors (derived based on comparing the SQLs for analytes listed as non-detect in the method blank and associated samples). Additionally, the provided QC summary sheets were reviewed, including holding times, internal standards, method blanks, system monitoring compounds, matrix spikes, and laboratory control samples. All of these results were within the listed QC limits.

SOIL SAMPLES
Commercial Laboratory Soil Organics Example SQL Calculation – Method 8270D
2-Methylnaphthalene in sample PIPE-40-110610
Blank SQL = Sample SQL x 10x dilution factor = 0.3 mg/kg

641425

Sample ID	Matrix	Date	Hazardous Substance	Hazardous Substance Concentration	Sample Quantitation Limit[a]
PIPE-40-110610	Soil	11/6/10	2-Methylnaphthalene	0.82 mg/kg	0.3 mg/kg
			Acenaphthene	0.50 mg/kg	0.3 mg/kg
			Anthracene	0.65 mg/kg	0.3 mg/kg
			Benz(a)anthracene	1.7 mg/kg	0.3 mg/kg
			Benzo(a)pyrene	2.1 mg/kg	0.3 mg/kg
			Benzo(b)fluoranthene	2.1 mg/kg	0.3 mg/kg
			Benzo(g,h,i)perylene	1.9 mg/kg	0.3 mg/kg
			Benzo(k)fluoranthene	0.76 mg/kg	0.3 mg/kg
			Chrysene	1.6 mg/kg	0.3 mg/kg
			Dibenz(a,h)anthracene	0.30 mg/kg	0.3 mg/kg
			Fluoranthene	3.7 mg/kg	0.3 mg/kg
			Fluorene	0.40 mg/kg	0.3 mg/kg
			Naphthalene	57 mg/kg	0.5 mg/kg
			Phenanthrene	1.7 mg/kg	0.3 mg/kg
			Pyrene	5.4 mg/kg	0.3 mg/kg
PIPE-80-110610	Soil	11/6/10	2-Methylnaphthalene	300 mg/kg	6 mg/kg
			Acenaphthene	88 mg/kg	6 mg/kg
			Anthracene	130 mg/kg	6 mg/kg
			Benz(a)anthracene	120 mg/kg	6 mg/kg
			Benzo(a)pyrene	110 mg/kg	6 mg/kg
			Benzo(b)fluoranthene	100 mg/kg	6 mg/kg
			Benzo(g,h,i)perylene	84 mg/kg	6 mg/kg
			Benzo(k)fluoranthene	38 mg/kg	6 mg/kg
			Chrysene	130 mg/kg	6 mg/kg
			Dibenz(a,h)anthracene	13 mg/kg	6 mg/kg
			Dibenzofuran	18 mg/kg	6 mg/kg
			Fluoranthene	300 mg/kg	6 mg/kg
			Fluorene	120 mg/kg	6 mg/kg
			Naphthalene	320 mg/kg	5 mg/kg
			Phenanthrene	440 mg/kg	6 mg/kg
			Pyrene	400 mg/kg	6 mg/kg

mg/kg – milligrams per kilogram

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Semivolatile Compounds By EPA Method 8270D

Client Sample ID:	Method Blank	Client:	Aspect Consulting
Date Received:	Not Applicable	Project:	Bremerton MGP Site, F&BI 011097
Date Extracted:	11/09/10	Lab ID:	00-1833 mb
Date Analyzed:	11/19/10	Data File:	111923.D
Matrix:	Soil	Instrument:	GCMS3
Units:	mg/kg (ppm)	Operator:	YA

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
2-Fluorophenol	81	30	118
Phenol-d6	79	30	118
Nitrobenzene-d5	98	10	180
2-Fluorobiphenyl	100	40	130
2,4,6-Tribromophenol	68	16	116
Terphenyl-d14	118	30	144

Compounds:	Concentration mg/kg (ppm)	Compounds:	Concentration mg/kg (ppm)
Phenol	<0.3	3-Nitroaniline	<0.9
Bis(2-chloroethyl) ether	<0.03	Acenaphthene	<0.03
2-Chlorophenol	<0.3	2,4-Dinitrophenol	<0.9
1,3-Dichlorobenzene	<0.03	Dibenzofuran	<0.03
1,4-Dichlorobenzene	<0.03	2,4-Dinitrotoluene	<0.03
1,2-Dichlorobenzene	<0.03	4-Nitrophenol	<0.3
Benzyl alcohol	<0.03	Diethyl phthalate	<0.03
Bis(2-chloroisopropyl) ether	<0.03	Fluorene	<0.03
2-Methylphenol	<0.3	4-Chlorophenyl phenyl ether	<0.03
Hexachloroethane	<0.03	N-Nitrosodiphenylamine	<0.03
N-Nitroso-di-n-propylamine	<0.03	4-Nitroaniline	<0.9
3-Methylphenol + 4-Methylphenol	<0.6	4,6-Dinitro-2-methylphenol	<0.9
Nitrobenzene	<0.03	4-Bromophenyl phenyl ether	<0.03
Isophorone	<0.03	Hexachlorobenzene	<0.03
2-Nitrophenol	<0.3	Pentachlorophenol	<0.3
2,4-Dimethylphenol	<0.3	Phenanthrene	<0.03
Benzoic acid	<1.5	Anthracene	<0.03
Bis(2-chloroethoxy)methane	<0.03	Carbazole	<0.03
2,4-Dichlorophenol	<0.3	Di-n-butyl phthalate	<0.03
1,2,4-Trichlorobenzene	<0.03	Fluoranthene	<0.03
Naphthalene	<0.03	Pyrene	<0.03
Hexachlorobutadiene	<0.03	Benzyl butyl phthalate	<0.03
4-Chloroaniline	<3	Benz(a)anthracene	<0.03
4-Chloro-3-methylphenol	<0.3	Chrysene	<0.03
2-Methylnaphthalene	<0.03	Bis(2-ethylhexyl) phthalate	<0.3
Hexachlorocyclopentadiene	<0.09	Di-n-octyl phthalate	<0.03
2,4,6-Trichlorophenol	<0.3	Benzo(a)pyrene	<0.03
2,4,5-Trichlorophenol	<0.3	Benzo(b)fluoranthene	<0.03
2-Chloronaphthalene	<0.03	Benzo(k)fluoranthene	<0.03
2-Nitroaniline	<0.03	Indeno(1,2,3-cd)pyrene	<0.03
Dimethyl phthalate	<0.03	Dibenz(a,h)anthracene	<0.03
Acenaphthylene	<0.03	Benzo(g,h,i)perylene	<0.03
2,6-Dinitrotoluene	<0.03		